REMARKS

Claims 1-6, 9-20, 23 and 29-33 are pending in the application.

Claims 1-6, 9-20, 23 and 29-33 have been rejected.

Claim 31 has been amended.

Claims 34-39 have been added. Support for these claims is found, at least, at ¶ 25 of the specification. No new matter is added.

Formal Matters

Applicants thank the Examiner for pointing out the typo in claim 31. Claim 31 has been amended to depend from claim 30.

Rejection of Claims under 35 U.S.C. § 103(a)

Claims 1-6 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Pauwels (USPPN 2001/0030974 A1) ("Pauwels") in view of Johnson (USPN 6,834,315) ("Johnson"). Applicants respectfully traverse this rejection.

Applicants respectfully submit that a prima facie case of obviousness has not been established relating to at least claim 1, and that claim 1 is therefore patentable over the suggested combination of Pauwels and Johnson. § 2143.02 of the MPEP states "The prior art can be modified or combined to reject claims as prima facie obvious as long as there is a reasonable expectation of success." (emphasis supplied) Applicants respectfully submit that one of ordinary skill would recognize that there is no reasonable expectation of successfully combining Pauwels and Johnson as proposed by the Office Action.

Pauwels discloses a system of suspending transmission from lower priority queues and allowing transmission of data from higher priority queues. *See*, e.g., Pauwels, Abstract. Pauwels is particularly directed towards controlling switching of network traffic. Pauwels, ¶ 1. As is well-known, and as is explicitly disclosed by Pauwels,

network traffic is carried in packets or cells, and these cells are of a variable size. *See*, e.g., Pauwels, ¶ 5. This size variability, and the possibility of large packets, is what motivated Pauwels to allow interruption of data without having to wait until the end of a a packet. Pauwels, ¶ 14.

On the other hand, Johnson is directed towards managing the flow of I/O requests. Johnson, Abstract. Johnson discloses a system to allow low priority requests to interrupt a stream of high priority requests. Johnson, 4:60-67. Johnson discloses that a predetermined number of low priority requests are sent when a high priority stream of requests is interrupted. *Id.*

The Office Action states that Johnson could be combined with Pauwels to teach interrupting a second stream to resume a first data stream. That is, that Pauwels' interrupting stream of higher priority data could be interrupted, and a predetermined number of lower priority packets could be transmitted. Office Action, p. 3. However, as already discussed, packets may be of variable length. Applicants respectfully submit that sending a predetermined number of lower priority packets could result in starvation of higher priority traffic, thus defeating an express objective of Pauwels' method (i.e., "keep the delay (variation) of high priority cells caused by low priority cells low") and rendering the method unworkable.

Based, at least, on the above arguments, Applicants respectfully submit that claim 1 is patentable over the proposed combination of Pauwels and Johnson. Applicants also submit that claims 2-6 are similarly allowable at least by virtue of depending from an allowable base claim.

Claims 1-6, 9-18, 20 and 23 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Ellis et al. (USPN 5,497,371) ("Ellis") in view of Johnson. Applicants respectfully traverse this rejection. The Office Action suggests combining the same elements of Johnson with Ellis as with Pauwels. Office Action, page 6. Ellis, similar to Pauwels, deals with switching network traffic comprised of packets and cells which may be of variable size. Ellis 1:39-40. Applicants respectfully submit that attempting to combine Johnson with Ellis as suggested in the Office Action would defeat an express purpose disclosed in Ellis, namely preventing long data packets from interfering with

delay sensitive voice packets. See, e.g., Ellis 1:42-43. Ellis would thus become unworkable.

Accordingly, Applicants respectfully submit that a prima facie case of obviousness has not been established and independent claims 1, 13, and 23 are allowable over the cited references. Applicants also submit that claims 2-6, 9-12, 14-18, and 20 are similarly allowable at least by virtue of depending from allowable base claims. Applicants respectfully request withdrawal of the rejection of these claims, and an indication of allowability of the same.

Claim 19 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Ellis and Johnson as applied to Claims 1-6, 9-18, 20 and 23 above and further in view of Hebb et al. (USPN 6,463,067) ("Hebb"). Applicants respectfully traverse this rejection. Applicants' arguments relating to the proposed combination of Ellis and Johnson are equally applicable to the rejection, based on said combination, of claim 19. Therefore, Applicants respectfully submit that claim 19 is allowable over the proposed combination, for the reasons presented above, and respectfully request notice to that effect.

Claims 32 and 33 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Ellis and Johnson as applied to claims 1-6, 9-18, 20 and 23 and further in view of Kadambi et al. (USPN 7,145,869) ("Kadambi"). Applicants respectfully traverse this rejection. Applicants' arguments relating to the proposed combination of Ellis and Johnson are equally applicable to the rejection, based on said combination, of claims 32 and 33. Therefore, Applicants respectfully submit that claims 32 and 33 is allowable over the proposed combination, for the reasons presented above, and respectfully request notice to that effect.

Further, regarding claim 32, the Office Action states that Ellis and Johnson do not teach implementing first and second FIFOs as circular FIFOs, in a single memory, and that the boundary between first and second FIFOs is set by a pointer. Office Action, page 12. The Office Action cites Kadambi as purportedly supplying this missing disclosure. Applicants respectfully disagree. The cited passages of Kadambi read:

> Arbitration for the CPS channel occurs out of band. Every module (EPIC, GPIC, IPIC, etc.) monitors the channel, and matching destination ports

> respond to appropriate transactions. C-channel arbitration is a demand priority round robin arbitration mechanism. If no requests are active, however, the default module, which can be selected during the configuration of SOC 10, can park on the channel and have complete access thereto. If all requests are active, the configuration of SOC 10 is such that the MMU is granted access every other cell cycle, and EPICs 20, GPICs 30, and IPIC 90 share equal access to the C-channel on a round robin basis. Kadambi 8:54-65; and
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> FIG. 54 shows a block diagram of the embodiment described above. Within each IPIC 90 there will be a pre-scheduler 101, whose function is to select one of the sixteen queues at a time to send into one of the four COS queues. FIG. 54 also shows the sixteen queues whose status is maintained at each source IPIC 90. Generally speaking, in operation, when the status of an egress COS queue is EMPTY or ALMOST EMPTY, then a pointer entry is immediately written into standard COS queues, which is serviced by a general queuing algorithm noted above. However, if a packet arrives at the source IPIC 90 and the destination COS queue status for that port is FULL or ALMOST FULL, then the packet pointer entry is not immediately written into the standard COS queue, even if it is a higher priority, provided that there are other COS queues waiting to be serviced. Rather, the logic of the present invention delays writing the packet pointer entry into the COS queue until the queue status reaches a predetermined level. As such, the higher priority COS queue, one of 16, will be serviced depending upon the egress queue status.

Kadambi 72:18-37. The cited passages disclose granting access to a channel on a round-robin basis. Round-robin is not the same thing as a circular FIFO. As is well-known, round-robin means that each of a plurality of interface controllers is granted access to a channel in sequential order, i.e., the controllers take turns and once each controller has been granted access, the first controller is granted access again and the order repeats. Round-robin scheduling is generally oblivious to priority, and provides access based on time or bandwidth, which is contradictory to Applicants' claims. A circular FIFO means that when an address pointer reaches a certain point in the FIFIO, the pointer jumps back to the beginning of the FIFO. Support for this definition is found, at least, at paragraph 0018 of the specification. And while the cited passages disclose a pointer and a plurality of queues, they fail to disclose, at least, FIFOs implemented in a single memory, and that a pointer sets the boundary between a first and second FIFO.

Further, Applicants respectfully submit that the motivation to combine the references stated in the Office Action is improper. The Office Action states that it would have been obvious to one of ordinary skill to modify Ellis and Johnson to include features purportedly taught by Kadambi "in order to provide a method for avoiding out-of-ordering of frames in a network." Office Action, page 13. Applicants respectfully point out that this purported motivation is nothing more than the title of Kadambi, and does not constitute reasoning sufficient to support a finding of obviousness.

Regarding claim 33, the Office Action states that Ellis and Johnson do not disclose stopping transmission of a frame of said second data stream after detection of a start of said frame and prior to detection of an end of said frame. The Office Action cites the following passage of Kadambi as purportedly supplying the missing disclosure:

> At clock cycle 5, second search engine 214 looks in memory address 17, comparing destination address search key AH with entry R, and determines that the search should continue at higher memory address locations, as the desired address is numerically less than the entry stored at memory address location 17. At clock cycle 6, second search engine 214 looks in memory address location 25, comparing the source search key Z with entry Z, and determines that the result is a hit at clock 7. The source address lookup for the second data packet is therefore complete. At clock cycle 7, second search engine 214 continues looking for the destination address by looking in memory address location 25, and comparing the destination search key AH with entry Z. This comparison determines that the search should continue at higher memory address locations.

Kadambi 26:15-30 (cited at Office Action, page 13). Applicants are unable to find any teaching in the cited passage which is comparable to the claimed stopping transmission of a frame of said second data stream after detection of a start of said frame and prior to detection of an end of said frame.

Applicants therefore respectfully submit that since the cited references fail to teach each feature recited in claims 32 and 33 and since Applicants have shown that no permissible rationale has been advanced in support of combining Kadambi with Ellis and Johnson, claims 32 and 33 are allowable over the propose combination of references. Applicants respectfully request withdrawal of the rejection of these claims and indication of allowability of the same.

Rejection of Claims under 35 U.S.C. § 102(e)

Claims 29-31 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Kadambi. Applicants respectfully traverse this rejection and submit that the cited passages of Kadambi fail to disclose each limitation found in claims.

Regarding claim 29, as an initial matter, Applicants respectfully point out that the Office Action does not provide any indication of what, if any, section of Kadambi purportedly teaches the feature of "at any time during said transmission, interrupting said transmission of said first data stream," as recited in claim 29

Further, the Office Action cites Kadambi 38:45-64 as purportedly teaching:

resuming transmission of said first data stream, wherein
the first switch code comprises at least one of an indication that the data following the first switch code has a different priority than the data preceding the first switch code and that the data preceding the first switch code is the last data of a frame.

The cited passage of Kadambi reads:

> Using the counter and the COS queues, packets in a particular traffic stream can be delayed as necessary in order to bring the traffic stream into compliance with the desired traffic profile. This can be controlled through the use of COS manager 133 and transaction fifo 132, as illustrated in FIG. 13. Packet pointers that depend upon the differentiated services code point (DSCP) are placed in one of the COS queues in transaction fifo 132, and scheduler 134 picks up the next packet depending upon the priority determination of COS manager 133. Queue scheduling algorithms can be programmed into COS manager 133 as appropriate for a particular application. Strict priority based scheduling can be implemented, wherein packets in the high priority COS queue are taken up first for transmission. However, this can result in starvation of low priority COS queues. An option for resolving this difficulty, therefore, is implementing a weighted priority based scheduling scheme, wherein a minimum bandwidth is provided to all COS queues, so that no queue gets starved as a result of priority allocation.

Kadambi 38:45-64 (cited at Office Action, page 14). Applicants respectfully submit that the cited passage does not disclose the claimed features. The cited passage discloses a "weighted priority based scheduling scheme" which is different from the interrupt based switching method of claim 29. The cited passage does not, and could not, disclose resuming a first data stream, because the cited passage does disclose a first data stream

ever being interrupted. Instead, a predetermined (based on priority) amount of bandwidth is allocated to a queue, and then a predetermined amount of bandwidth is guaranteed to another priority queue.

Further, the Office Action states "NP value equals 1x interpreted as the first switch code" and "NP value is found not equals 1X interpreted as the second switch code." Office Action, page 14. The passage cited in support of this interpretation is:

> Returning to step 46-10, if the RMF value is not equal to 0 or 3, then the logic continues to step 46-11, where the logic checks to see if the NP value equals lx. If so, then the logic gets the 802.1 p packet priority from the 802.1p priority field before continuing to step 46-18. If the NP value is not found to be equal to 1.times. at step 46-11, then the logic checks to see if the NP value equals 1 at step 46-15. If the NP value equals 1, then the logic picks up the COS queue value from the DSCP priority queue before continuing to step 46-18. If the NP value is not equal to 1 at step 46-15, then the logic continues directly to step 46-18 without modification of the COS queue. At step 46-18, if the FFP-DSCP equals 1 or the DSCP_flag equals 1, then the DSCP field is changed, the IP checksum is recalculated, and the CRC is regenerated. In this step, the DSCP field will come from the FFP logic if FFP_DSCP equals 1, if not, then the value will come from the DSCP logic. Upon completion of these actions, the DSCP logic continues to step 464.

Kadambi 41:47-64. Applicants respectfully submit that the cited passage fails to disclose transmitting a first and second switch code having the following features (as recited in claim 29):

> the first switch code comprises at least one of an indication that the data following the first switch code has a different priority than the data preceding the first switch code and that the data preceding the first switch code is the last data of a frame, and
> the second switch code comprises at least one of an indication that the data following the second switch code has a different priority than the data preceding the second switch code and that the data preceding the second switch code is the last data of a frame.

Applicants respectfully submit that the cited passage discloses a single variable (NP value) which can be several values (e.g., 1x, 1, not 1). Unlike the claimed switch codes, which are transmitted, the cited passage does not disclose transmitting the variable, or any of the values. And the only thing the variable signifies is where the differential services logic should look (e.g. 802.1 p priority field, DSCP priority queue). There is no indication of priority of data preceding or succeeding the NP value. This

makes sense. Since the NP value is not disclosed as being transmitted, preceding and succeeding are meaningless concepts to the cited passage. Therefore, Applicants respectfully submit that the cited passage fails to disclose each feature recited in claim 29. Accordingly, Applicants respectfully request a withdrawal of the rejection of claim 29 and an indication of allowability of the same.

Regarding claim 30, the Office Action cites the following passage of Kadambi as purportedly teaching a first and second crossbar, each crossbar configured to receive a data stream of different priority:

> These additional two stacking configurations are illustrated in FIGS. 27A and 27B, respectively. FIG. 27A illustrates SOC 10(1) connected to ring R through ICM 271(1), as well as SOC 10(2) being connected to ring R through ICM 271(2). This configuration enables a plurality of SOC 10 switches to be stacked. In one embodiment, as many as 32 SOC 10 switches could be attached to ring R. FIG. 27B illustrates a crossbar configuration, wherein SOC 10(1) and 10(2) are connected to crossbar C through ICM 271(1) and 271(2), respectively. This configuration, like that of FIG. 27A, enables a significant number of SOC switches to be stacked. The crossbar C is a known device which acts as a matrix or grid which is capable of interconnecting a plurality of ports through activation of an appropriate matrix connection.

Kadambi 61:3-17 (cited at Office Action, page 15). Applicants point out that the above passage clearly discloses only one crossbar, to say nothing of the configuration of the crossbar. The Office Action also states that "COS manager interpreted as priority switch circuit." In support, the Office Action cites:

> The COS manager 133 can also be programmed using a strict priority based scheduling method, or a weighted priority based scheduling method of selecting the next packet pointer in transaction FIFO 132. Utilizing a strict priority based scheduling method, each of the eight COS priority queues are provided with a priority with respect to each other COS queue. Any packets residing in the highest priority COS queue are extracted from transaction FIFO 132 for transmission. On the other hand, utilizing a weighted priority based scheduling scheme, each COS priority queue is provided with a programmable bandwidth. After assigning the queue priority of each COS queue, each COS priority queue is given a minimum and a maximum bandwidth. The minimum and maximum bandwidth values are user programmable. Once the higher priority queues achieve their minimum bandwidth value, COS manager 133 allocates any remaining bandwidth based upon any occurrence of exceeding the maximum bandwidth for any one priority queue. This configuration

> guarantees that a maximum bandwidth will be achieved by the high priority queues, while the lower priority queues are provided with a lower bandwidth.

Kadambi 57:52-58:5 (cited at Office Action, page 15). The COS manager is cited as purportedly disclosing the following features recited in claim 30:

> a priority switch circuit coupled to said first buffer and said second buffer, wherein said priority switch circuit is configured to, upon detection of data of said second data stream, interrupt a transmission of data of said first data stream from the first buffer at any time during said transmission and transmit data of said second data stream from the second buffer

Applicants respectfully note that even if the COS manager were comparable to the claimed priority switch circuit (a point which Applicants do not concede), the cited passage of Kadambi does not disclose interrupting a transmission of data of a first data stream at any time and transmitting data of a second data stream, as claimed. Therefore, Applicants respectfully submit that the cited passages fail to disclose each element recited in claim 30. Accordingly, Applicants respectfully request a withdrawal of the rejection of claim 30 (and claim 31, which depends therefrom) and an indication of allowability of same.

New Claims

Applicants have added dependent claims 34-39, which recite limitations substantially similar to:

> said interrupting said transmission of said second data stream utilizes a leaky
> bucket mechanism, wherein
> said leaky bucket mechanism comprises:
> a packet buffer;
> generating a token; and
> granting the token to a frame.

Support for these claims is found, at least, at ¶ 25 of the specification. No new matter is added. Applicants respectfully submit that the features recited in claims 34-39 are not disclosed by any of the cited references.

CONCLUSION

In view of the amendments and remarks set forth herein, the application and the claims therein are believed to be in condition for allowance without any further examination and a notice to that effect is solicited. Nonetheless, should any issues remain that might be subject to resolution through a telephonic interview, the Examiner is invited to telephone the undersigned at 512-439-5092.

If any extensions of time under 37 C.F.R. § 1.136(a) are required in order for this submission to be considered timely, Applicant hereby petitions for such extensions. Applicant also hereby authorizes that any fees due for such extensions or any other fee associated with this submission, as specified in 37 C.F.R. § 1.16 or § 1.17, be charged to deposit account 502306.

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